The listing of the claims provided below is intended to replace all prior versions and listings of the claims in the application.

LISTING OF THE CLAIMS

1. (Previously Presented) An aeroelastic analysis system, the system comprising:

an input module configured to receive one or more input parameters associated with aeroelastic characteristics of a structure, the one or more input parameters relating to a completed repair of the structure; and

a neural network module coupled to the input module, and configured to generate a transformation of the one or more input parameters to produce at least one aeroelastic analysis result, the transformation based in part on a trained neural network, wherein the at least one aeroelastic analysis result may be used to determine whether the aeroelastic characteristics of the structure with the completed repair are acceptable.

2. (Original) The system of claim 1, further comprising an output module coupled to the neural network module, and configured to output the at least one aeroelastic analysis result.

3. (Original) The system of claim 1, wherein the input module comprises at least one input/output (I/O) device selected from the group comprising a keyboard, a keypad, a computer mouse, a trackball, a button, a switch, a slides, a knobs, and a dial.

4. (Original) The system of claim 1, wherein the input module comprises at least one input/output (I/O) device selected from the group comprising an electronic port, an electrical connector, a receiver, a wireless receiver, an optical reader, an optical detector, a magnetic reader, and a magnetic detector.

5. (Original) The system of claim 1, wherein the one or more input parameters comprise:

a weight; and

a location of the weight on the structure.

6. (Original) The system of claim 1, wherein the neural network module comprises:

a weight vector module configured to multiply the one or more input parameters by a weighting vector to generate one or more weighted parameters;

a bias module configured to provide a scalar bias value;

a summer coupled to the weight vector module and the bias module and configured to output a sum of the one or more weighted parameters and the bias value; and

a transfer function module coupled to the summer and configured to apply a transfer function to the sum.

7. (Original) The system of claim 6, wherein the transfer function comprises a non-linear transfer function.

8. (Original) The system of claim 6 wherein the transfer function comprises a tangent sigmoid function.

9. (Original) The system of claim 6, wherein the transfer function comprises at least one function selected from the group comprising a sigmoid, a hyperbolic tangent sigmoid, a logarithmic sigmoid, a linear function, a saturated linear function, and a radial basis function.

10. (Original) The system of claim 1, wherein the at least one aeroelastic analysis result comprises a flutter frequency at a damping value.

11. (Original) The system of claim 1, wherein the at least one aeroelastic analysis result comprises a flutter speed at a damping value.

12. (Original) The system of claim 1, wherein the at least one aeroelastic analyses result comprises a flutter frequency and a corresponding flutter speed at a damping value.

13. (Previously Presented) The system of claim 1, wherein the at least one aeroelastic analysis result comprises a contour plot of store loads.

14. (Canceled).

15. (Canceled).

16. (Canceled).

17. (Previously Presented) A method of performing aeroelastic analysis, the method comprising:

determining input parameters relating to one or more completed repairs performed on a structure;

determining a training set of characteristic I/O pairs;

generating a neural network;

training the neural network using the training set to generate a trained neural network;

determining aeroelastic characteristics of the structure based in part on the trained neural network; and

determining whether the aeroelastic characteristics of the structure with the one or more completed repairs are acceptable.

18. (Original) The method of claim 17, further comprising determining an accuracy of the aeroelastic characteristics determined using the trained neural network.

19. (Original) The method of claim 17, further comprising:

determining a weight vector in the trained neural network; and

determining a bias value in the trained neural network.

20. (Original) The method of claim 19, wherein determining the aeroelastic characteristics comprises:

multiplying received input parameters by the weight vector to generate weighted parameters;

summing the weighted parameters and the bias value to generate a summed input; and

applying the summed input to a transfer function associated with a neuron in the trained neural network.

21. (Previously Presented) A method of performing aeroelastic analysis, the method comprising:

receiving at least one input parameter related to a completed repair of an aircraft structure;

applying a predetermined neural network transfer function to the at least one input parameter to generate an aeroelastic analysis result, wherein the aeroelastic analysis result may be used to determine whether the aircraft structure with the completed repair is acceptable for flight; and

outputting the result.

22. (Original) The method of claim 21, wherein receiving at least one input parameter comprises:

receiving a weight; and

receiving location of the weight on the aircraft structure.

23. (Original) The method of claim 21, wherein applying the predetermined neural network transfer function comprises:

multiplying the at least one input parameter with a weight vector to produce at least one weighted input parameter;

summing together the at least one weighted input parameter and a bias value to generate a summed value; and

applying a neuron transfer function to the summed value.

24. (Original) The method of claim 21, wherein the aeroelastic analysis result comprises a flutter speed at a damping value.

25. (Original) The method of claim 21, wherein the aeroelastic analysis result comprises a flutter frequency at a damping value.

26. (Original) The method of claim 21, wherein the aeroelastic analysis result comprises a flutter speed and an associated flutter frequency at a damping value.

27. (Original) The method of claim 21, wherein the aeroelastic analysis result comprises a contour plot of store loadings.

28. (Previously Presented) One or more processor readable instructions stored in one or more storage devices, the one or more processor readable instructions, when executed by a processor instructing the processor to perform the method comprising:

receiving at least one input parameter related to a completed repair of an aircraft structure;

applying a predetermined neural network transfer function to the at least one input parameter to generate an aeroelastic analysis result, wherein the aeroelastic analysis result may be used to determine whether the aircraft structure with the completed repair is acceptable for flight; and

outputting the result.

29. (Previously Presented) One or more processor readable instructions stored in one or more storage devices, the one or more processor readable instructions, when executed be a processor instructing the processor to perform the method comprising:

receiving a mass input related to a completed repair;

receiving a location of the mass on an aircraft structure;

multiplying the mass input and location with a weight vector to produce weighted input parameters;

summing together weighted input parameters and a bias value to generate a summed value;

applying a neuron transfer function to the summed value to generate an aeroelastic analysis flutter result, wherein the aeroelastic analysis flutter result may be used to determine whether the aircraft structure with the completed repair is acceptable for flight; and

outputting the flutter result.

30. (Previously Presented) An aeroelastic analysis system, the system comprising:

means for receiving input parameters relating to a completed repair of an aircraft structure;

means for applying a neural network transfer function to the input parameters to generate an aeroelastic analysis result, wherein the aeroelastic analysis result may be used to determine whether the aircraft structure with the completed repair is acceptable for flight; and

means for outputting the result.

31. (Previously Presented) The system of claim 1, wherein the one or more input parameters relating to a completed repair of the structure relate to a repair performed on an aircraft.

32. (Previously Presented) The system of claim 31, wherein the at least one aeroelastic analysis result is generated after the completed repair is completed and before the aircraft is used for flight.

33. (Previously Presented) The system of claim 1, wherein the structure is at least one of a stabilator, a wing, an elevator, a canard, an aileron, a flap, a spoiler, a stabilizer, a tail section, and a rudder of an aircraft.

34. (Previously Presented) The system of claim 1, wherein the neural network is a feed forward neural network.

35. (Previously Presented) The system of claim 5, wherein at least one of the weight and the location of the weight on the structure exceed a predetermined category of approved repair parameters.

36. (Previously Presented) The method of claim 17, wherein the structure is an aircraft.

37. (Previously Presented) The method of claim 36, wherein the step of determining aeroelastic characteristics of the structure based in part on the trained neural network is performed after the completed repair is completed and before the aircraft is used for flight.

38. (Previously Presented) The method of claim 17, wherein the structure is at least one of a stabilator, a wing, an elevator, a canard, an aileron, a flap, a spoiler, a stabilizer, a tail section, and a rudder of an aircraft.

39. (Previously Presented) The method of claim 17, wherein the neural network is a feed forward neural network.

40. (Previously Presented) The method of claim 17, wherein the step of determining input parameters further comprises:

determining a weight; and

determining a location of the weight relating to the one or more completed repairs performed on the structure.

41. (Previously Presented) The method of claim 40, wherein the weight and the location of the weight relating to the one or more completed repairs performed on the structure exceed a predetermined category of approved repair parameters.

42. (Previously Presented) The method of claim 21, wherein the step of applying the predetermined neural network transfer function to the at least one input parameter to generate the aeroelastic result is performed after the completed repair is completed and before the aircraft structure is used in flight.

43. (Previously Presented) The processor readable instructions of claim 28, wherein the step of applying the predetermined neural network transfer function to the at least one input parameter to generate the aeroelastic analysis result is performed after the completed repair is completed and before the aircraft structure is used in flight.

44. (Previously Presented) The processor readable instructions of claim 28, wherein the aircraft structure is at least one of a stabilator, a wing, an elevator, a canard, an aileron, a flap, a spoiler, a stabilizer, a tail section, and a rudder of an aircraft.

45. (Previously Presented) The processor readable instructions of claim 28, wherein the step of receiving the at least one input parameter comprises:

receiving a weight; and

receiving a location of the weight relating to the completed repair of the aircraft structure.

46. (Previously Presented) The processor readable instructions of claim 45, wherein the weight and the location of the weight relating to the one or more completed repairs performed on the structure exceed a predetermined category of approved repair parameters.

47. (Previously Presented) The processor readable instructions of claim 29, wherein the step of applying the neuron transfer function to the summed value to generate the aeroelastic

flutter result is performed after the completed repair is completed and before the aircraft structure is used in flight.

48. (Previously Presented) The system of claim 30, wherein the neural network transfer function is applied to the input parameters to generate the aeroelastic analysis result after the completed repair is completed and before the aircraft structure is used in flight.

49. (Previously Presented) The system of claim 30, wherein receiving the input parameters comprises:

receiving a weight; and

receiving a location of the weight relating to the completed repair of the aircraft structure.

50. (Previously Presented) The system of claim 49, wherein the weight and the location of the weight relating to the one or more completed repairs performed on the structure exceed a predetermined category of approved repair parameters.